

Cotton Waste Machinery



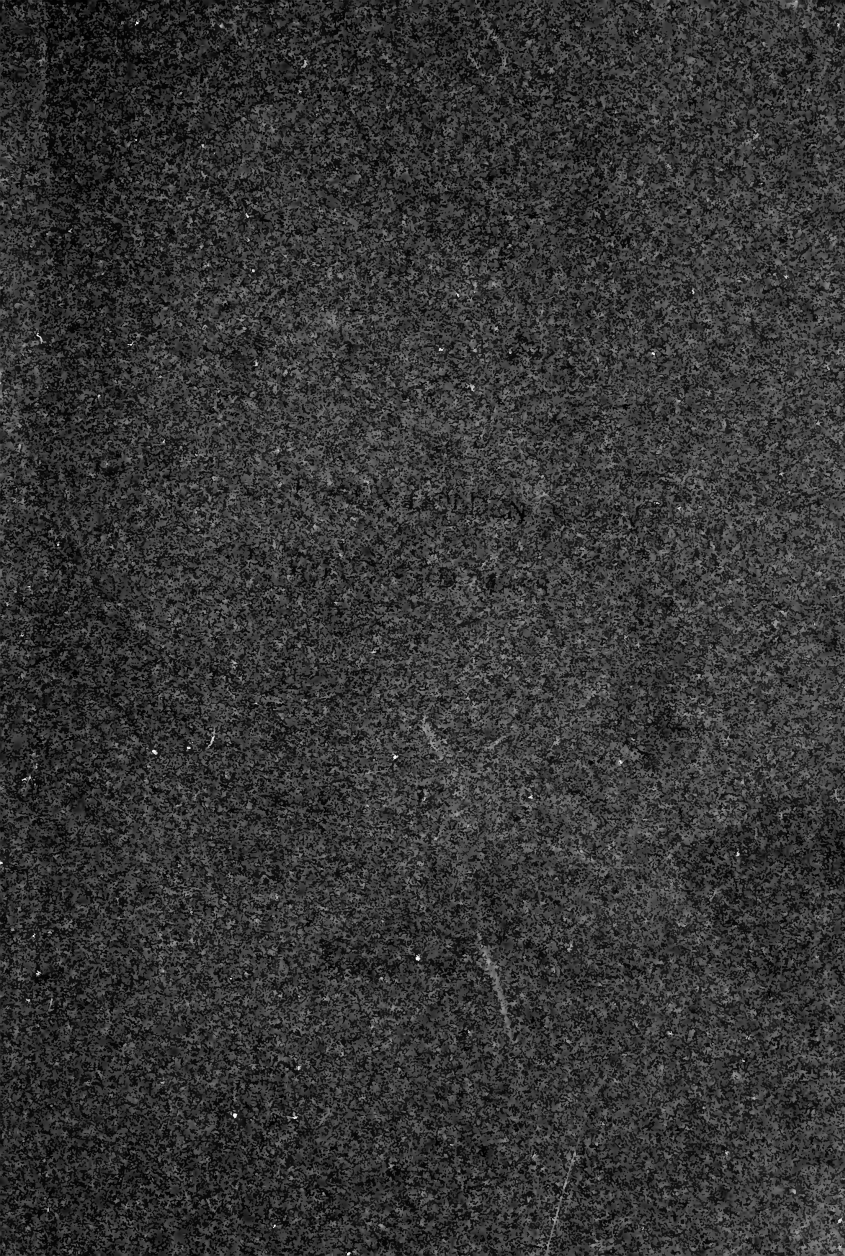
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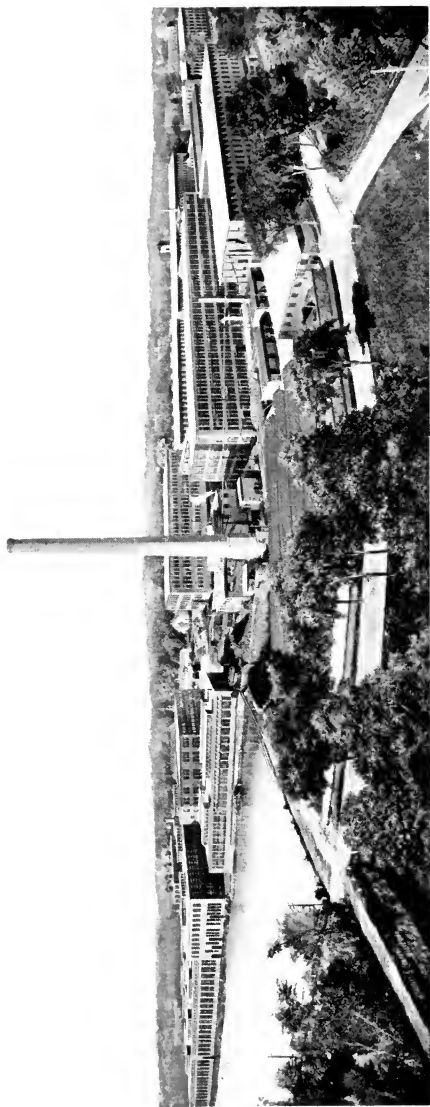
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The Whitin Machine Works, 1914

1914

Illustrated and Descriptive Catalog

OF

AND OF

Various Systems of Working Cotton Waste



Issued by

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Printed by
PERRY & SEARLE CO.
Lynn, Mass.

1490

TS1583
W58W289
1914

INTRODUCTORY

This catalog is intended to bring before the thoughtful consideration of textile manufacturers the processes and machinery required for the **Reclamation of Cotton Waste**.

The economical and profitable disposal of the waste products of a cotton manufacturing plant has become a problem of the greatest importance to manufacturers on account of the prevailing high prices of cotton and labor necessary to convert it into marketable goods. The reclamation of the waste products of a mill affords simple means for the manufacturer to reduce his manufacturing expense to a minimum.

To meet the demands of progressive manufacturers for a line of machinery for reclaiming their waste products, we have developed and placed on the market machines that have proven themselves particularly well adapted for such work.

On the following pages illustrations and descriptions are given of the machines required in both the **Coiler** and **Condenser Systems of Reclamation of Waste**. Estimates of machinery required for either system will be gladly furnished if samples of the waste to be used, average counts desired and production per week are given.

In addition to the machines herein described, we call the attention of manufacturers to the other machines we build, viz.: Picking Machinery, Revolving Flat Cards, Sliver and Ribbon Lap Machines, Combers, Railway Heads, Drawing Frames, Roving Machinery, Spinning Frames, Twister Frames, Spoolers, Reels, Quillers, Plain and Fancy Looms, Duck Looms, Dobbies and Warp Stop-Motions. Descriptive catalogs of any or all of these machines may be had on application.

THE WHITIN MACHINE WORKS.

September 1, 1914.

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GENERAL

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SYSTEMS OF WORKING COTTON WASTE

The **American Cotton Manufacturer** has for some time now been keenly interested in solving the problem of his cotton waste. With waste running from 12% to 20% on carded work, and from 20% to 35% on combed work, it may readily be seen that the problem is an important one, and that a proper solution affords large opportunities for savings in the average cotton mill. It is, therefore, with pleasure that we call the attention of the trade to the complete systems of **Waste Handling Machinery** which we have developed in the last few years, designed especially to meet American conditions. For the past five years we have studied carefully what has been done in this country and abroad, and have conducted extensive experiments with the idea of adopting such principles in the manufacture of waste as would operate most successfully under conditions as we have them in this country. This has resulted in the adoption of two distinct systems; one of which we term the Coiler or Cotton Process; the other the Condenser System.

The Coiler System will probably commend itself to most manufacturers for the reason that it is based on the customary process used in the average cotton mill. In this process the stock is double carded, using the Full Roller Card as a Breaker, and a Full Roller or Top Flat Card with two, four or eight-coiler front as a finisher, omitting the drawing frames, taking the sliver directly to the slubber, and for numbers up to 12's using one process of roving only. This system gives excellent results where a fairly good stock is used, which has some staple. This method, however, is useful particularly where warp yarns or hard twisted threads are required, and is used for weaving print cloths, carpets, towels, and coarse sheetings; also for making ropes, twines, etc. It is not adaptable to as low grades of stock as can be run on the condenser system; neither does it make as soft or even a yarn. Where strength is required, and quality is not the first consideration, the economy

of manufacture on this system is attractive to those who want a simple arrangement to work up waste in their mills; a system, also, which does not require skilled help or as complicated machinery as the condenser system involves.

The Condenser System has the advantage of making a soft, full, even yarn from a very low grade of waste, and can handle, without difficulty, waste in which the staple is of uneven length. The yarn is used as a hosiery yarn, and as filling for weaving soft or napped cotton fabrics, such as counterpanes, flannelettes and cotton blankets.

This System has many minor variations to fit different conditions, and we are prepared to handle practically any kind of low grade cotton waste with it. We use ordinarily a set of two cards of the full roller type which are supplied with cotton either by a lap from the picker or by an automatic feed. The cards may be connected in a number of ways, the most usual being a **Cross Feed** between the cards, although frequently the finisher card is fed with laps from the breaker made on a Derby Doubler.

We have a number of ways for taking the roving from the finisher card, including the **Tape Condenser** which takes off 80 to 96 good ends for the 48" width machine, and single or double apron rubs using the ring doffer. The spools of roving can be spun to advantage on any one of three separate types of spinning frames which we have developed to meet the various demands of waste spinning. In this connection it is interesting to note that by our present methods on the **Condenser System** it is possible to make yarns of low grade waste at least 25% finer in numbers and at considerably less labor cost than has been possible heretofore by the use of the woolen system.

On pages 81 to 91 plans and descriptions of several equipments are shown which will give an idea of the kind and amount of machinery required to use up various grades of waste. For the information of those interested, we are showing three complete units for spinning yarn; also one for converting roving and spinner's waste into sliver; and one for reclaiming the long fibres from card strips, etc.



Bale Breaker

BALE BREAKER

This Machine is designed for the purpose of opening the stock from the bale. Where any great amount of stock is to be handled, the machine can be placed in the warehouse, and as the stock passes through the machine, it can be distributed or exhausted to the bins in the cleaning and mixing department.

The Production of this machine is from 15,000 to 20,000 lbs. in 10 hours, and it delivers the stock to the next process opened in the best possible condition.

Speed of main shaft 450 r. p. m. Size of pulleys 12" x 2½".

Horse Power consumption is from 4 to 5 horse power.

Belting Required:

Pin apron belt 9', 3" of 3" belting.

Feed and Delivery apron belt 17', 0" of 2½" belting.

Extras:

Fans and Exhauster system,

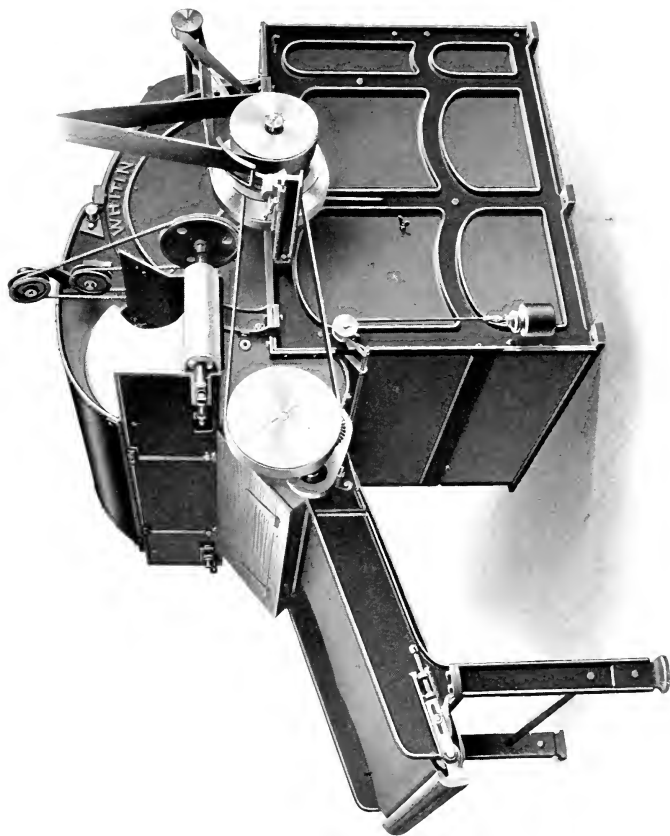
Traveling aprons and Convcyer system.

Floor Space: 13', 8" x 5', 10½".

Weights:

Net Weight 4500 pounds,

Shipping Weight 4600 pounds.



Willow

WILLOW

This Machine is used for cleaning any character of stock, and is equipped with a fan for down draft, exhausting the dust from the stock to the dust chamber of the Picking Department. It can be adjusted to willow the stock, more or less, as it may require. It can be made nearly automatic in its operation by cutting away the floor beneath the machine and allowing the dust to drop through onto an apron, which will carry it to the dumps; and the discharge of the clean stock can also be transferred by apron or exhauster system to bins. This machine is built with either hand feed or automatic feed.

The Production is 1500 to 2500 pounds per day of 10 hours.

Horse Power consumption is about 4 horse power.

Speed of cylinder 320 r. p. m. Size of pulleys 16" x 4".

Belting Required:

Feed apron belt 11', 0" of 2 $\frac{3}{4}$ " belting,

Fan belt 9', 9 $\frac{1}{2}$ " of 2" belting,

Regulator belt 4', 10" of 2" belting,

Roll belt 6', 4" of 1 $\frac{1}{2}$ " belting,

Delivery apron band 15', 0" x $\frac{5}{8}$ " diameter belting.

Extras Required:

Fans and pipes for exhauster system,

Traveling aprons and conveyer system.

Floor Space:

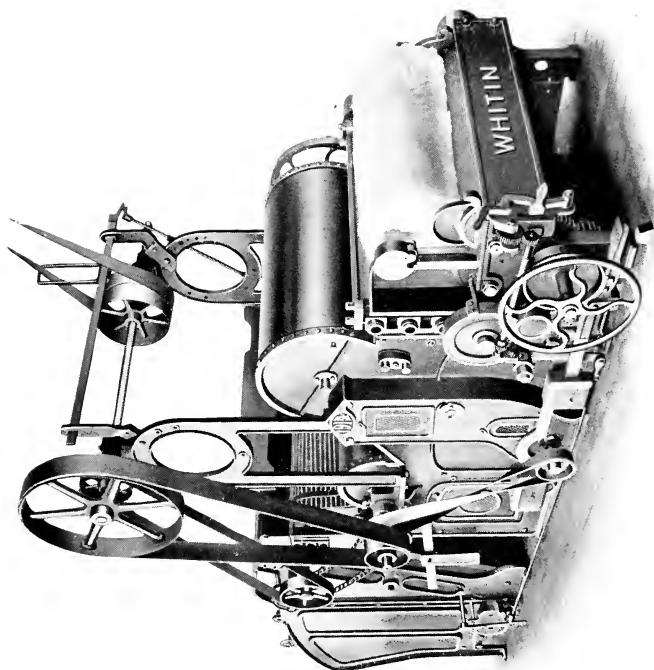
12', 0" x 7', 10" Hand Feed,

16', 10" x 7', 10" Automatic Feed.

Weights:

Net Weight 6700 pounds,

Shipping Weight 7000 pounds.



One Beater Breaker Lapper, with Automatic Feed

BREAKER LAPPER

This Machine is designed for the purpose of converting the raw stock into a lap. It is equipped with an Automatic Feed and one Beater, and cleans the stock in a superior manner. Preferably we recommend this machine to be built with two Beaters—the first of the Buckley Type—the second a Carding Beater.

The Production is 1800 pounds to 3200 pounds per day of 10 hours.

The Horse Power consumed is from 5 to 10 horse power, according to the number of beaters.

Speed of driving shaft 435 r. p. m. Size of pulleys 16" x 4 $\frac{1}{4}$ ".

Belting Required:

Fan belt 7', 11" of 2 $\frac{1}{2}$ " belting,

Beater belt 17', 5" of 4" belting,

Calender roll driving belt 12', 7" of 2 $\frac{1}{2}$ " belting,

Cone belt 6', 9" of 1" belting,

Doffer belt 10', 11" of 2 $\frac{1}{2}$ " belting,

Pin apron belt 5', 10" of 2 $\frac{1}{2}$ " belting.

Extras Required:

Lap Rods,

Automatic Feed,

Extra Beater Section,

Buckley Opener Section,

Steel Trunk Section,

Split Lap Preventers,

Adjustable Grid Bars.

Floor Space:

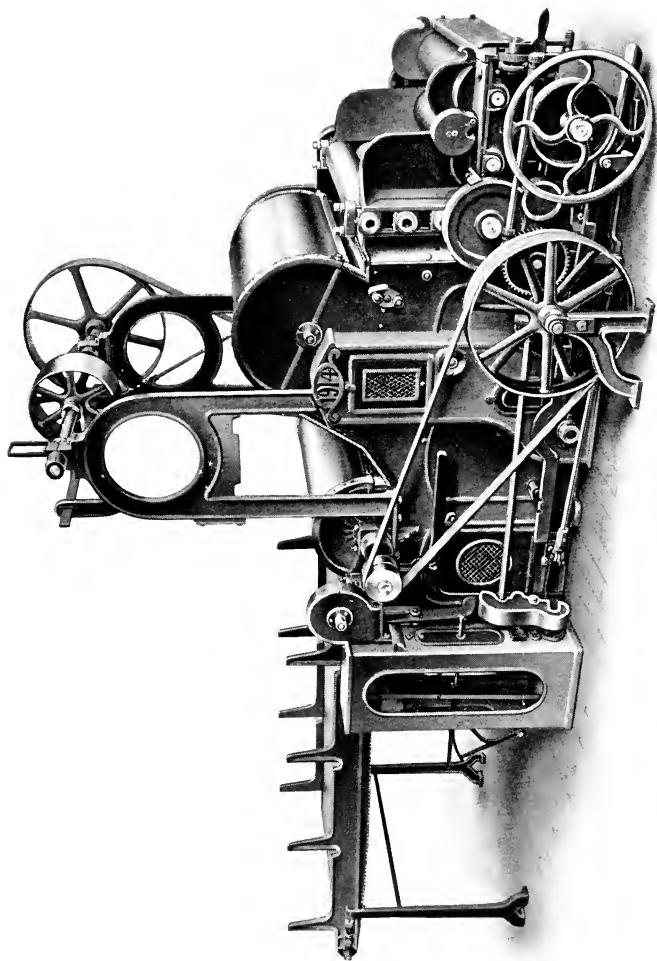
One Beater Machine 16', 0" long by 6', 8" wide,

Two " " 22', 0" " " 6', 8" "

Weights:

Net Weight 8000 pounds,

Shipping Weight 8500 pounds.



Finisher or Intermediate Lapper

FINISHER LAPPER

This Machine is used for second and third processes in picking, where, on the better classes of yarn, it is necessary to clean the stock a little better. The machine is equipped with an arrangement for doubling four laps at the back, and also an evener motion. It is used to form laps for the Breaker Cards, using the breaker picker laps on the back when used as an Intermediate and Intermediate laps when used as a Finisher.

The Production is 1500 to 3000 pounds per day of 10 hours.

Horse Power consumed about 5.

Speed of driving shaft 435 r. p. m. Size of pulleys 16" x $4\frac{1}{4}$ ".

Belting Required:

Cone belt 6', 9" of 1" belting,

Beater belt 14', 8" of 4" belting,

Calender roll driving belt 12', 7" of $2\frac{1}{2}$ " belting,

Fan belt 7', 11" of $2\frac{1}{2}$ " belting.

Extras:

Adjustable Grid Bars,

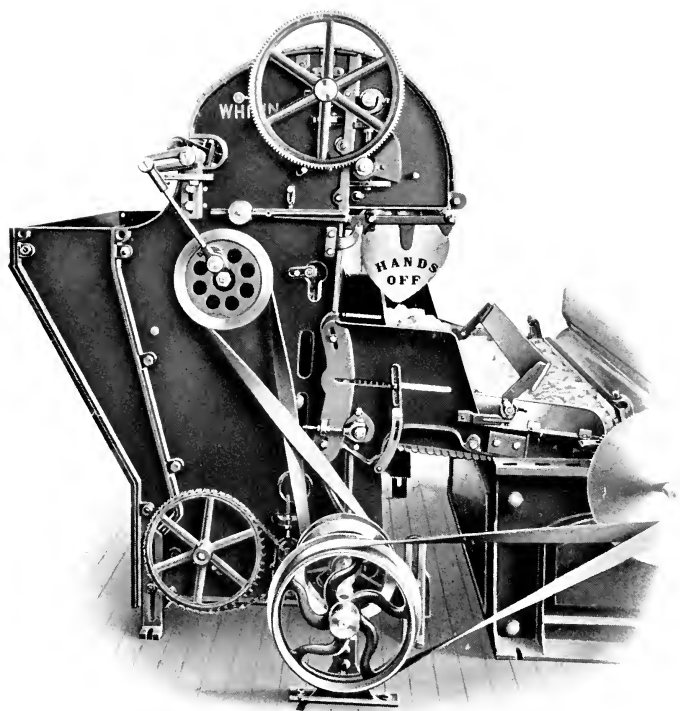
Lap Rods.

Floor Space: 16', 0" x 6', 8".

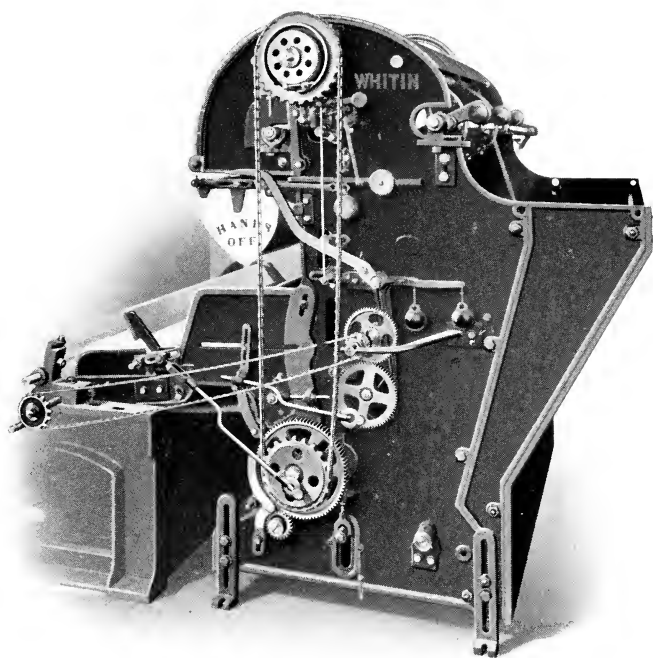
Weights:

Net Weight 6000 pounds,

Shipping Weight 6200 pounds.



Automatic Feed
(Driving Side)



Automatic Feed
(Scale Side)

AUTOMATIC FEED

This Machine is used for feeding the stock to the breaker card, when pickers are not used, and it is recommended for the lower grades of stock, as it does not injure it, and gives as even a feed to the card as can be obtained, provided the machine is properly adjusted.

The Production is equal to the production of the card to which it is attached.

Size of pulleys 14" x 2 $\frac{3}{4}$ ".

Horse Power: $\frac{1}{4}$ horse power.

Belting Required:

Cone belt 8', 4 $\frac{1}{2}$ " of 2 $\frac{1}{2}$ " belting,

Doffer apron belt 9', 4 $\frac{1}{2}$ " of 1 $\frac{1}{2}$ " belting.

Extras:

Scott's Compensator,

Feed Roll.

Floor Space:

For 40" Card 5', 6" x 4', 6",

We build these for 40", 45", 48" and 51" Cards.

Weights:

Net Weight 1100 pounds,

Shipping Weight 1200 pounds.



Roving Waste Opener

ROVING WASTE OPENER

This Machine is used to open up roving or spinners' waste, preparatory to applying it at the back of our Roving and Spinners' Waste Card, either with an automatic feed or hand feed. We do not guarantee it to open up the stock absolutely, but we do recommend it to prepare the stock for this carding operation, so that when the stock is taken from the card it is properly prepared for the Drawing Frame, and it goes forward from this point with the regular work. In this operation there is practically no shrinkage of the stock, as is the case in other methods of handling.

The Production is 100 to 200 pounds per day of 10 hours.

Speed of main cylinder 850 r. p. m. Size of pulleys 12" x 2"

Horse Power: 4 horse power.

Belting Required:

Licker-in belt 4', 10" of 2½" belting,

Cross shaft belt 5', 10" of 2½" belting,

Delivery apron belt 10', 0" of 2½" belting.

Extras: Longer Aprons.

Floor Space: 10', 8" x 3', 0".

Weights:

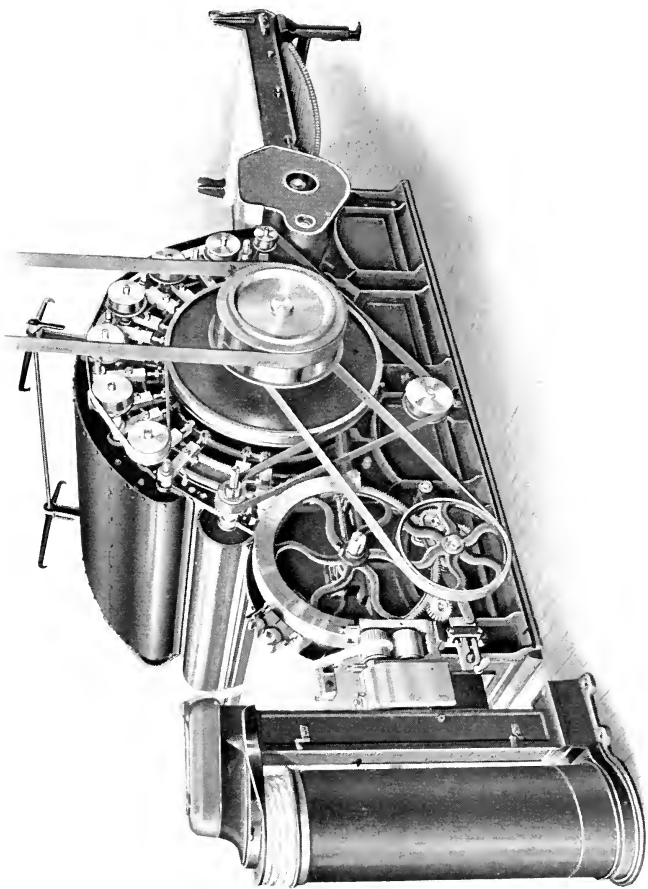
Net Weight 900 pounds,

Shipping Weight 1000 pounds.

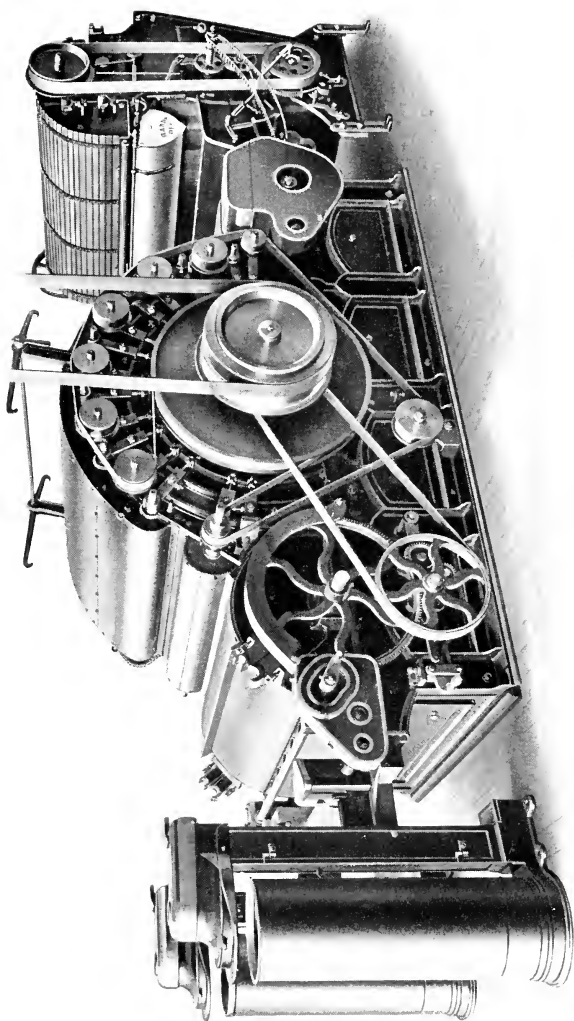
Settings of Beaters:

Licker-in to cylinder 10-1000",

Feed rollers to licker-in 10-1000".



· Roving Waste Card, with Single Coiler



Roving Waste Card, with Two Coilers and Automatic Feed

ROVING WASTE CARD

The **Roving Waste Card** is a machine that, after the stock is opened slightly, will convert it into sliver without waste, so that it can be taken from the front of the card and applied directly back of the Drawing Frame, whether it be combed or carded work.

This is a very profitable operation, as this character of waste is worth a good deal more than any other class of waste, and is of good staple, and, therefore, should not be a loss to any mill. Generally speaking, this machine is the most profitable to the manufacturer that can be included in any organization.

We build the Roving Waste Card with either Single or Double Coiler Front, because in cases where coarse hanks are to be converted into sliver, the product of the machine is greater than when the roving is very fine; and if the product of the card is great, we recommend a double coiler front, for the purpose of making a light sliver rather than running a doffer at a high rate of speed.

The Production is 100 to 200 pounds per day of 10 hours.

Speed of Cylinder: 165 r. p. m.

Size of Pulleys: 20" diameter by 3" face.

Horse Power: About 2 horse power.

Belting Required:

Stripper and fancy roll belt 24', 4" of 2" belting,

Doffer driving belt 11', 0" of 2" belting,

Licker-in driving belt 9', 0" of 2" belting,

Doffer comb and drive band 16', 6" of $\frac{3}{8}$ " banding,

Fancy roll clearer band 6', 0" of $\frac{3}{8}$ " banding.

Extras Required:

Roving Cans,

Hand Apron Feed,

Belt Conveyer Front,

Double Coiler Front,

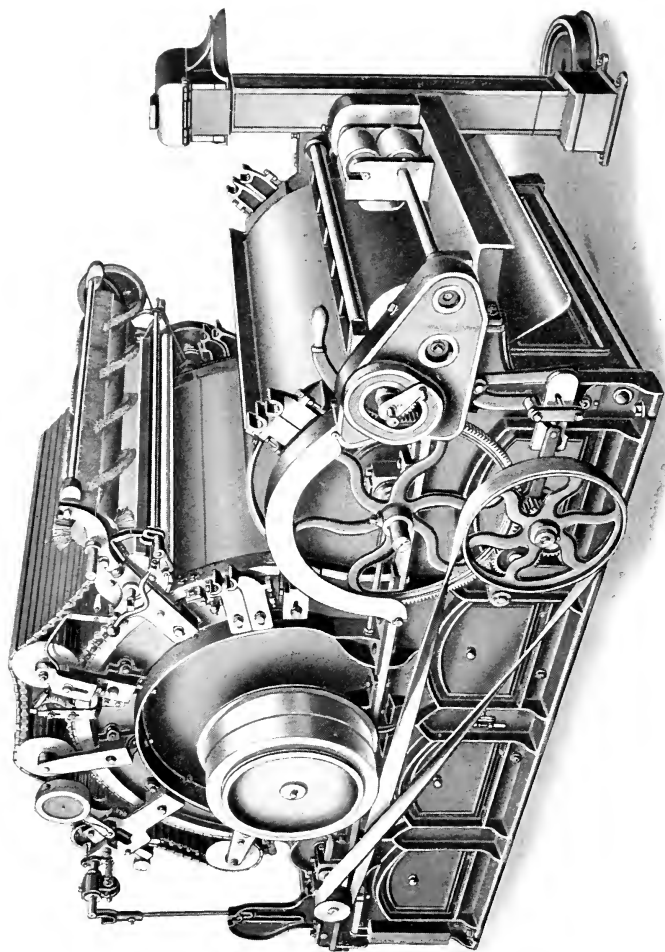
Automatic Feed.

Floor Space: 17', 9" by 6', 5" for 45" card.

Weights:

Net Weight 7750 pounds,

Shipping Weight 8950 pounds.



Revolving Flat Card

REVOLVING FLAT CARD

This Machine is our standard Revolving Flat Card. (For particulars see our 1912 catalog of "Cotton Card-Room Machinery," pages 10 to 33 inclusive.) The reclamation of waste applies to card strips, comber noil, and where a Roving and Spinners' Waste Department is not included in the organization, roving and spinners' waste is mixed with the strips and comber noil. From this stock can generally be reclaimed from 60 to 75% of good staple that is convertible into yarn by mixing at the back of the drawing frame $\frac{1}{8}$ with regular work. This stock is mixed in the Picking Department in the proportion as it comes from the mill, and is run through the usual picking machinery, making a finisher picker lap. This is applied to the revolving flat card and is carded in the regular way.

Production: 50 to 125 pounds per day of 10 hours.

Speed of Cylinder: 165 r. p. m.

Size of Pulleys: 20" diameter by 3" face.

Horse Power: .75 to 1.25 horse power.

Belting Required:

Doffer belt 14', 6" of 2" belting,

Licker-in belt 9', 2" of 2" belting,

Top flat belt 6', 0" of 1½" belting,

Comb belt 16', 10" of ¾" round belting,

Brush belt 5', 1" of ¾" round belting.

Note.—No allowance for lapping.

Weights:	40" Card.	45" Card.
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Net Weight	6200 pounds.	6500 pounds.
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Shipping Weight	6700 "	7100 "
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Floor Spaces outside 18 inches diameter lap and 10 inches coiler:

40" card with 27" doffer: 10', 6" by 5', 5¼" over all.

45" " " 27" " 10', 6" " 5', 10¼" " "

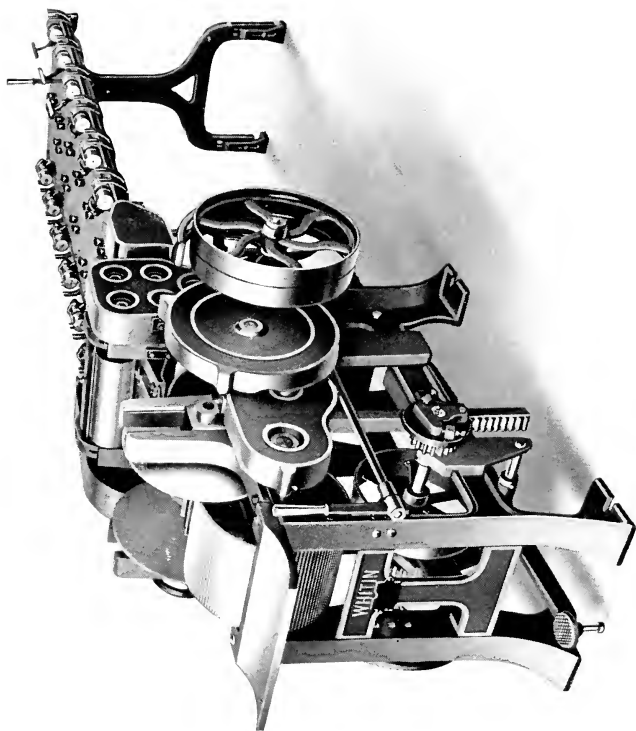
Extras required for every 20 cards:

One stripping roll for stripping doffers and cylinders,

One burnishing roll for burnishing clothing of flats, cylinders, and doffers,

One long grinder roll for grinding flats,

Two traverse grinders for grinding cylinders and doffers.



Derby Doubler

DERBY DOUBLER

This Machine, sometimes called a Sliver Lap Machine, is designed to take from 16 to 40 card slivers and form them into a lap for the card or the combing machine.

When used for reclaiming purposes the machine is equipped with a draw-box, comprising four rolls so geared as to impart a slight draft to the sliver, whereas for the Double Carding process no draw-box is used, as draft is not required.

The machine is made to form laps of the following widths, as ordered: $9\frac{3}{4}"$, $10\frac{1}{2}"$, $12"$, $19\frac{7}{8}"$, $22\frac{3}{8}"$ or $25\frac{3}{8}"$.

Driving Pulleys: $24"$ in diameter by $2\frac{1}{2}"$ face, and run one revolution to one of the $5"$ calender rolls.

Production:

With the reclaiming system at 75 r. p. m. of calender rolls, the machine will produce 840 pounds of laps weighing 400 grains per yard per day of 10 hours.

With double carding when used between Breaker and Finisher Cards, production at 40 r. p. m. is 3000 pounds per day of 10 hours.

Power: $\frac{1}{2}$ horse power required.

Floor Space: Including 20, 12-inch cans, $10'$, $6"$ long by $4'$, $3"$ wide.

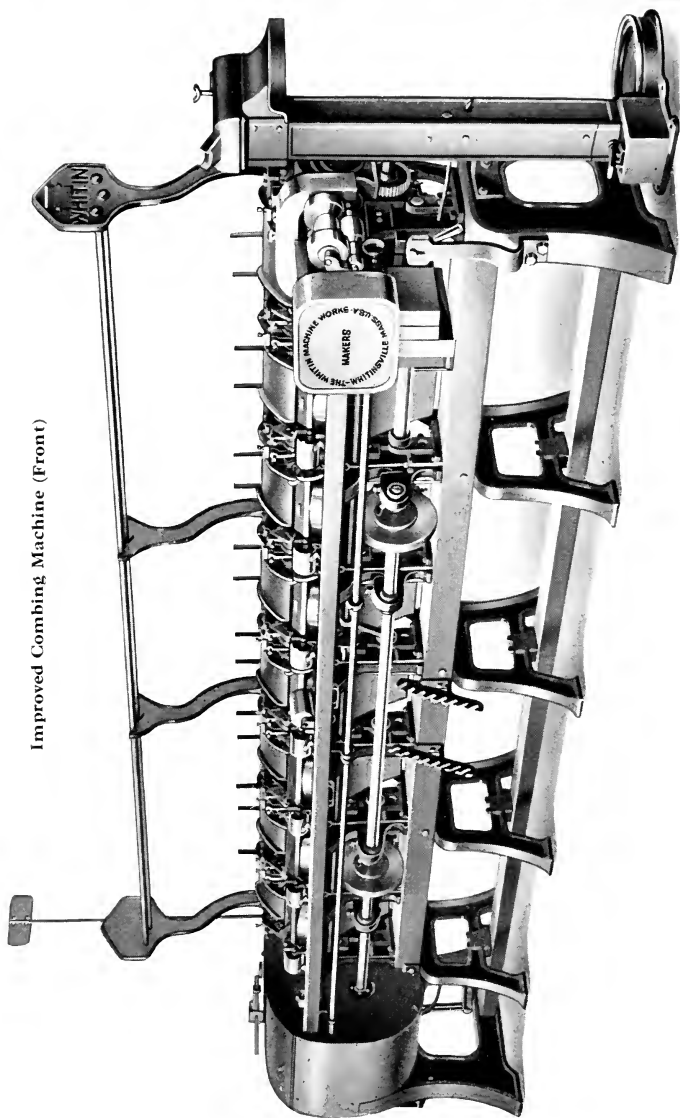
Weights:

Shipping Weight 2700 pounds,

Net Weight 2500 pounds.

For further particulars see our 1912 catalog "Cotton Card-Room Machinery," pages 40 to 49 inclusive.

Improved Combining Machine (Front)



Improved
Combing Machine
(Back)

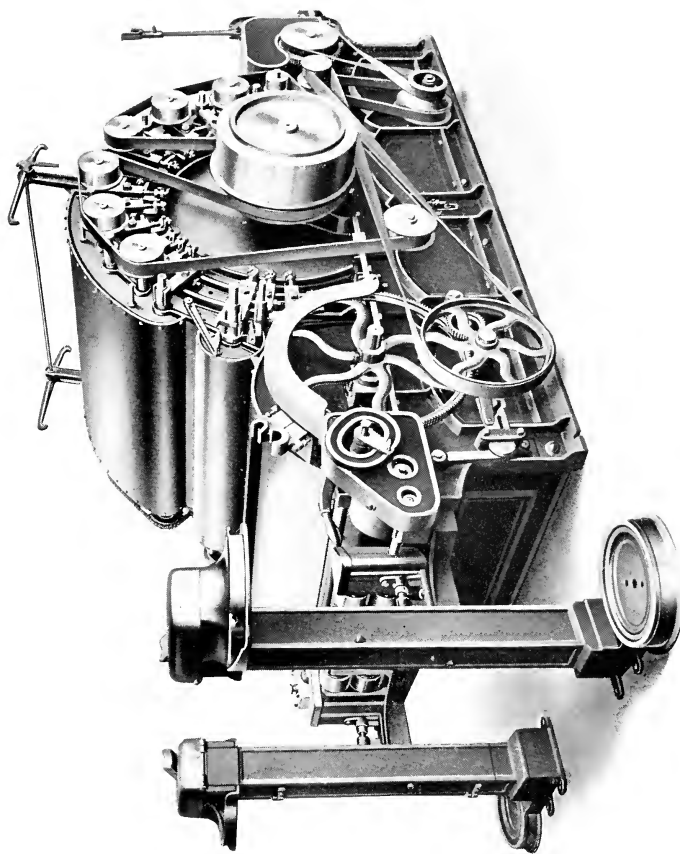


COMBING MACHINE

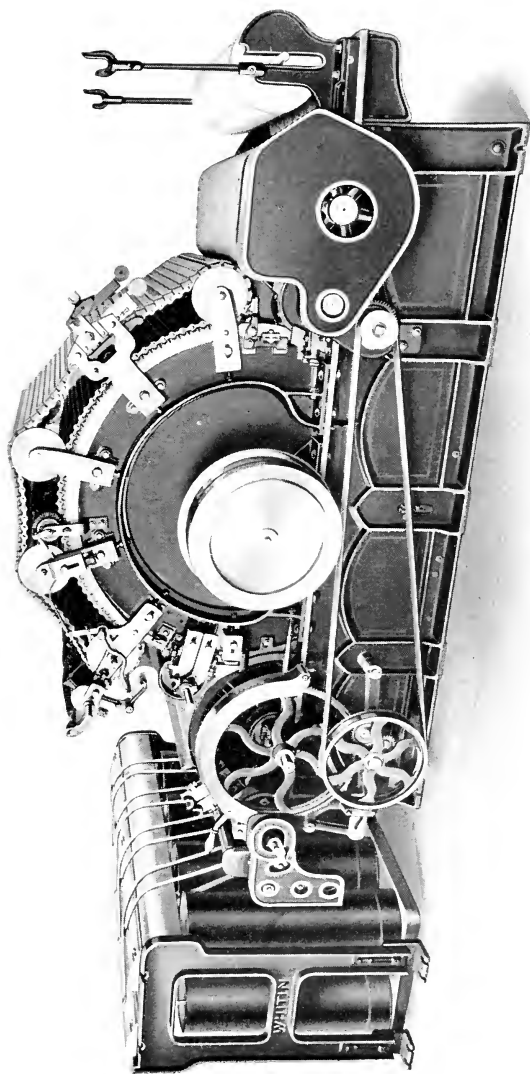
This Machine is used for reclaiming the fibres from card strips, comber noil, roving and spinners' waste, and the staple is nearly equal to anything that goes forward into the regular work. The laps are placed on the back, in the usual manner, and the good fibres are reclaimed, which may be spun into numbers ranging from 20's to 40's, equal to carded work, depending upon the character of waste from which they are reclaimed.

This is a very interesting and profitable operation, and we are always glad to give estimates in relation to the saving made.

For full particulars of this machine see our 1912 catalog "Cotton Card-Room Machinery," pages 58 to 76 inclusive.



Breaker Full Roller Card, with Two Coilers



Revolving Flat, Finisher Waste Card with Eight Coiler Front

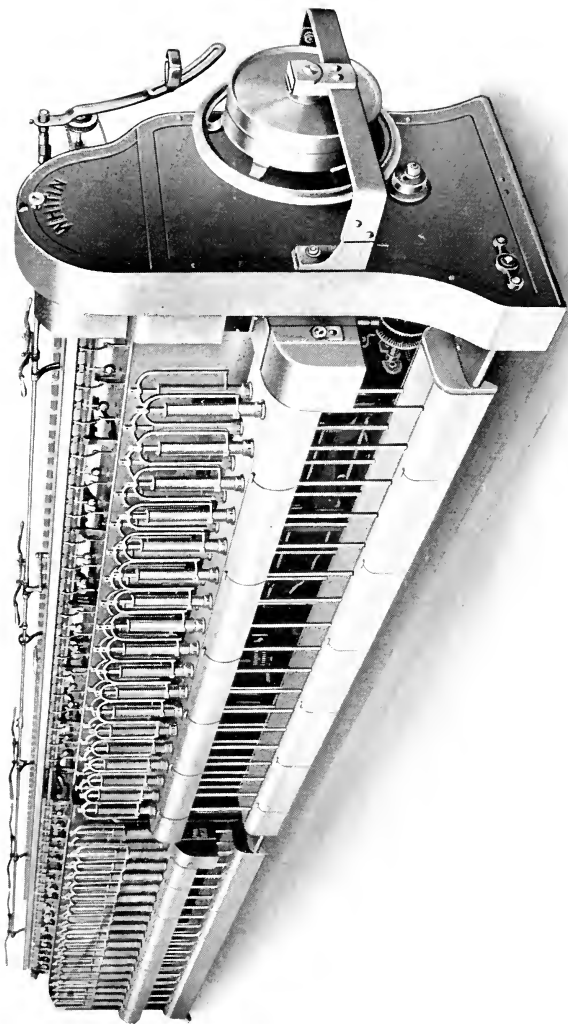
THE COILER SYSTEM

This System is well known in the manufacture of cotton yarns, having been used for many years with the regular machinery for producing low grade yarns from mixtures of waste and cotton, but manufacturers for some time have been trying to avoid the operation of mixing waste with their regular work on account of rejection of orders and general criticism from buyers, because of poor quality of the product. This has created a demand for the development of machinery with which they are familiar for the handling of different by-products without a mixture of cotton, and converting it into a marketable product, a system of machinery which would run sufficiently well to enable them to obtain maximum production at minimum labor cost. In comparison with other countries, the cost of the plant and the high cost of labor have been two very serious factors in this country in the development of this class of machinery. However, after considerable study, designing and many experimental tests, we have accomplished very satisfactory results, and now bring to the consideration of textile manufacturers our **Coiler System of Waste Machinery**, which consists of a Breaker Full Roller Card (see page 40), a Derby Doubler (see page 34), a Finisher Card (see preceding page), a Slubber (see page 44), and a Ring Spinning Frame. The product of the Breaker Card is taken in cans to the back of the Doubler, which prepares laps for the Finisher Card. This card may be of the **Revolving Flat Type**, as illustrated, or Full Roller, as desired. It is equipped with or without metallic breast, fancy roll and a four or eight-coiler-front. The slivers from this card are either doubled on the drawing frame, or preferably taken directly to the back of the slubber. For finer numbers, where a better grade of stock is used, it may be necessary, in order to accomplish good results, to run the roving from the slubber through another roving process. The adoption of this system we are confident will produce gratifying results in productions and labor costs.

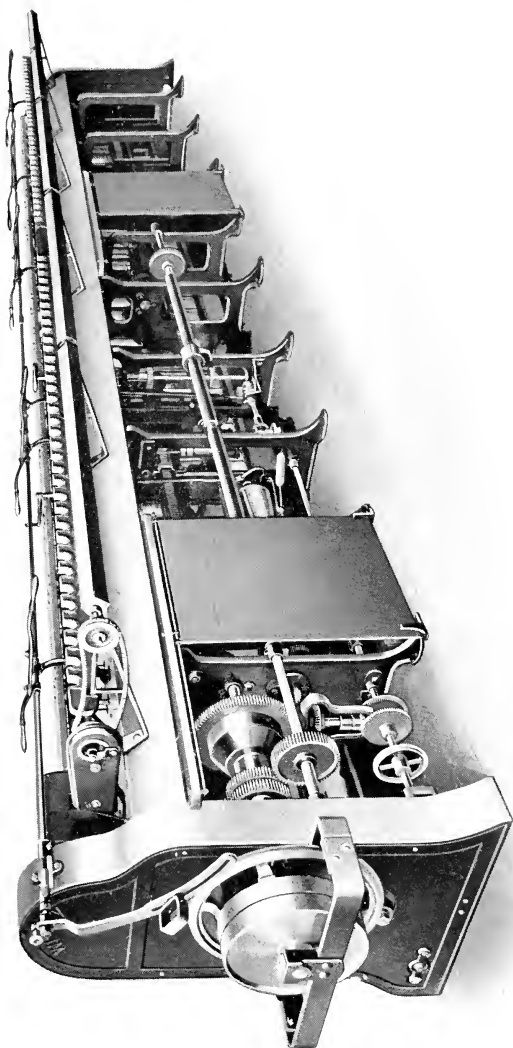
It is not possible to use so low a grade of stock as with the condenser system, because the yarn produced on that system is the

result of separating and rubbing the stock into a small roving, without draft. The finisher card is peculiarly adapted for running stock of such a nature as to prohibit much drafting, the weight of the slivers rendering it possible to obtain a much finer yarn, from low grade stock, than has previously been practical.

The roving cans are regular in size, allowing minimum handling, and the labor thus saved enters materially into lowering the cost of production.



Slubber (Front)



Slubber (Back)

SLUBBER

This Machine takes the sliver from the cans delivered from card front and imparts sufficient draft and twist for the succeeding operation of the Spinning Frame.

The machine is built with special features for the purpose of handling **Low Grade Stock**. The front steel roll is 1" in diameter instead of the usual $1\frac{1}{4}$ ", which allows the rolls to be set closer together to accommodate the shorter fibre. To lessen the breakage of the sliver as it is drawn from the cans, an auxiliary lifting roll is provided at the back of the machine.

The machine may be fitted with either direct weighted or **Self Balanced Rails** as preferred. It is fitted, if desired, with case-hardened front steel rolls, shell front top rolls, self-oiling steps, and sheet steel gear casings. As will be noted in the illustrations on the two preceding pages, the driving pulley arbor is supported by a yoke which insures freedom from vibration and ease of operation.

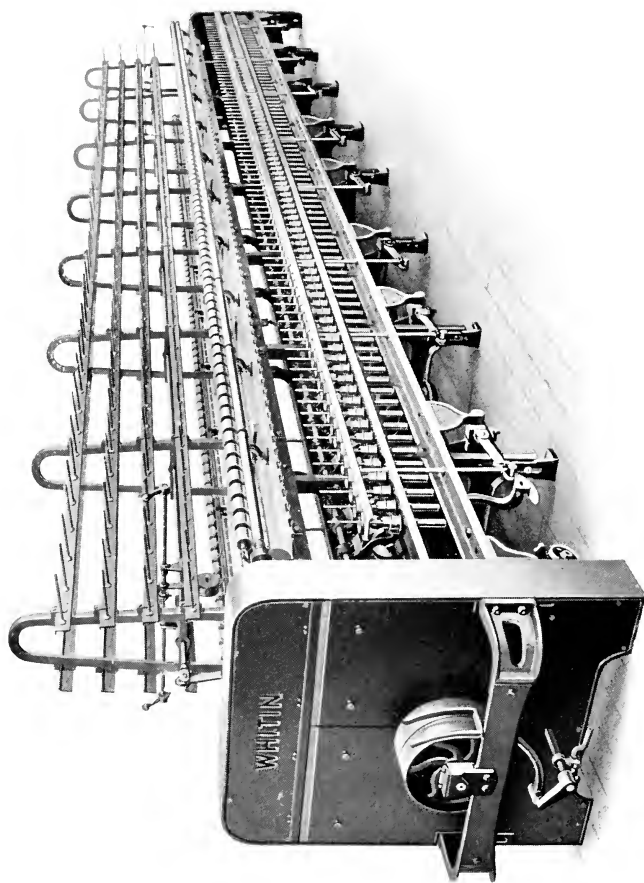
For Productions, etc., see our 1912 catalog of "Cotton Card-Room Machinery," pages 108 to 151 inclusive.



Ring Spinning Frame, with Tape Driven Spindles

RING SPINNING FRAME

The spinning frame used on the coiler system has a number of special features to fit it particularly for this waste work. It has a special arrangement of bottom steel rolls and top rolls so as to facilitate the setting of the frame for this class of work. This machine is built in a wide gauge, with large special rings and a long traverse. The illustration shows the frame equipped with the **Tape Drive Spindle**. It can be built either with the band or tape drive, as desired. The tape drive lends itself, perhaps, more appropriately to this class of work than the ordinary band drive. The tape drive frame shown has a specially designed geared end which facilitates all changes in the gearing, and accidents to operatives are avoided by the use of light steel panels, which completely enclose all working parts. The spindles used are the well-known Whitin Gravity Improved Type (patented), and are capable of high speed, steady running, and are especially recommended as free from tendency to throw oil, thus ensuring clean work. Outside of being particularly adapted and arranged for waste work, the construction of the frame is similar to the frames that we build for ordinary cotton spinning. Particulars as to production, change gears, etc., can be found in our 1911 catalog, on "Cotton Yarn Machinery," pages 10 to 115 inclusive.



Ring Twisting Frame, with Tape Driven Spindles

TWISTING FRAME

The illustration on the preceding page shows the latest development in our line of twisting frames with **Tape Driven Spindles**. The design embodies all the desirable features that our long experience with this class of machinery has demonstrated as necessary for a practical and economical working machine.

The frame may be built for either dry or wet twisting, as preferred, and of such number of spindles and gauge as best suits the requirements of the manufacturer.

The construction is similar to that of our spinning frame (illustrated on page 47) excepting the ring and bolster rails are of a much heavier design.

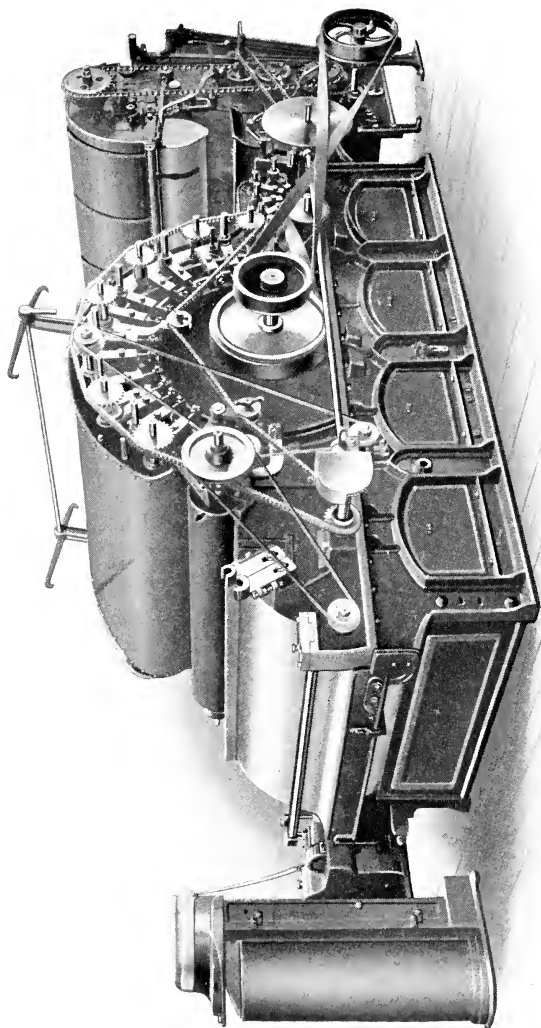
The frame is equipped with the tape driven Whitin Gravity type of spindles, which ensures uniformity in twist, large production and economy in operation.

This machine is particularly well adapted for twisting from two to six-ply waste yarns.

For further particulars, such as floor spaces, productions, gear changes, etc., see our 1911 catalog on "Cotton Yarn Machinery," pages 126 to 175.

CONDENSER SYSTEM

The Condenser System of spinning waste yarns, a modification of the woolen system, has been greatly improved and developed during recent years. As compared with other methods of handling waste it has many things to commend it, chief among which is its adaptability for various kinds of low grade waste. It is generally used for making coarse counts, and produces a full, even, lofty yarn. Because very little draft or twist is applied to the roving after leaving the cards, it is possible to spin fairly good yarns by this system from the lowest grades of waste, and from waste in which long and short fibres are mixed. This latter class of waste cannot be successfully handled by any other system. The condenser system admits of many variations in the manner of preparing the cotton for the cards, of connecting the cards, and of taking the roving from the finisher. We have a full line of this machinery to meet almost any condition. In this catalog we give detailed descriptions only of the types most in use, and will be glad to take up the matter of special equipment with those who do not find here exactly what they require.



Breaker Full Roller Card, with One Coiler and Automatic Feed

BREAKER FULL ROLLER CARD

The Cards used for the condenser system are of the full roller type, with 50" diameter cylinder and 27" diameter doffer, furnished in widths of 40", 45", 48" and 51". The cylinders, perfectly balanced and ground to a true surface, run in removable bronze bushings set in heavy pedestals so designed as to prevent any overflow of oil from getting on the clothing of the cylinder.

The entire framework is substantial. The workers and strippers are of cast iron, balanced and ground to true surfaces. All shafts are of steel, and the fast-running shafts are case-hardened, insuring long life and perfect settings. All parts of the card are capable of easy and accurate adjustment.

All parts of the card are so inclosed that drafts are avoided, and no waste can accumulate within the frame except what is taken out under the screens. These screens are also special in their construction and arrangement, and are of easy adjustment.

The Breaker Cards are built for either lap or automatic feed; with or without metallic breasts; always with a fancy. If a doubler is used between breaker and finisher as on the coiler system the breaker is equipped with a double coiler front or with belt conveyer front and one coiler. When a cross-feed is used the sliver is taken directly from the breaker card and laid either straight or diagonally across the back of the finisher.

Production: 200 to 400 pounds per day of 10 hours.

Speed of Cylinder: 100 to 165 r. p. m., depending on the class of stock used.

Size of Driving Pulleys: 20" x 3", 24" x 4", or 30" x 5".

Power: From 1½ h. p. to 3 h. p., depending on speed and production desired.

Clothing: Depending on class of work and grade of stock to be run. Counts of wire and foundations to suit.

Supplies: Roving Cans.

Extras: Supplied as ordered.

Automatic Feed,
Double Lap Back,
Metallic Breast,
Belt Shipper.

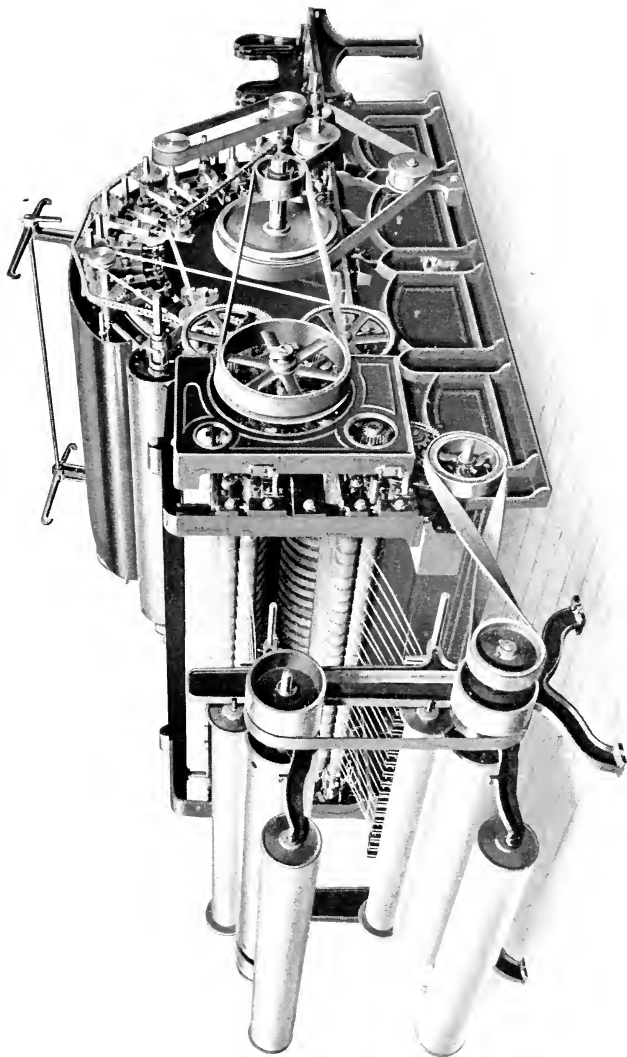
Floor Space: 48'' width.

Weights: 48''.

Net Weight 8200 pounds,
Shipping Weight 9500 pounds.

Note. The Derby Doubler used between these cards is shown on page 34.

Note. If Cross Feed is used, see pages 59 and 60.



Finisher Full Roller Card, with Double Bank Condenser

FINISHER FULL ROLLER CARD

The Finisher Cards are of the full roller type, similar in construction to the breaker card, with 50" Diameter Cylinder in widths of 40", 45", 48" and 51". The arches and bearings are so constructed that very accurate settings can be made and retained. All rolls have shell ends. Metallic breasts can be applied to the finisher cards when desired, or when the class of stock requires them; and all finisher cards are equipped with a fancy roll. Where **Derby Doublers** are used, the finisher cards are built with either single or double lap backs, and the lap is taken directly from the lap head to the back of the card. When the Derby Doubler is omitted, a cross-feed is used, the cards being connected either tandem or parallel. The finisher card is built with either a single or double doffer. With a single doffer, the roving is delivered to a single-bank condenser (see page 67), or to a four-bank tape condenser (see page 61). Where the double doffer is used, the roving is delivered to a double-bank condenser, or, under certain conditions, to a tape condenser. Each of these various methods of condensing and delivering the roving has its advantages, the style used depending on the conditions to be met.

Production: 175 to 300 pounds per day of 10 hours, depending on roving to be made and quality required.

Speed of Cylinder: 100 to 165 r. p. m., depending on stock to be carded.

Size of Driving Pulleys: Either 20" x 3", 24" x 4", or 30" x 5".

Power: 3 to 7 h. p., depending on style of machine.

Supplies: Jack Spools.

Extras:

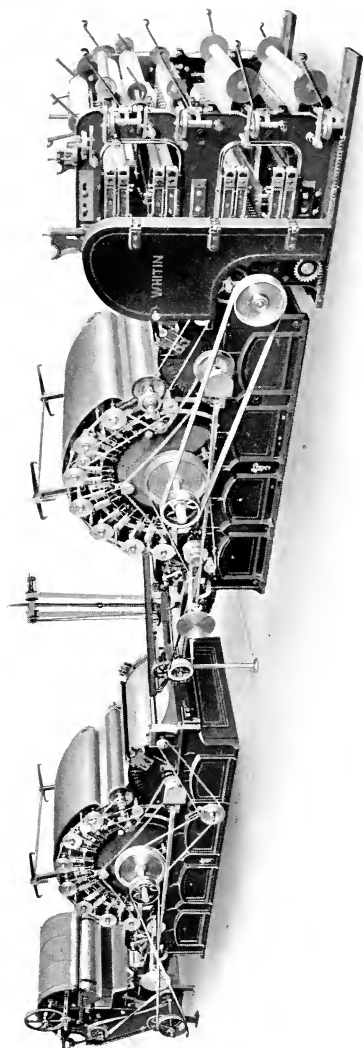
Double Lap Back,
Cross Feed.

Extras:

Tape Condenser,
Single Bank Condenser,
Two Bank Condenser,
Metallic Breast.

Weight:

Net Weight, 48" card, 8200 pounds,
Shipping Weight, 48" card, 9500 pounds.



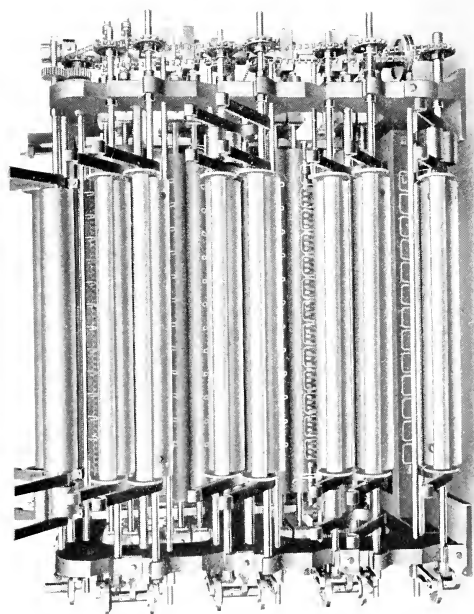
Two-Card Set

TWO-CARD SET

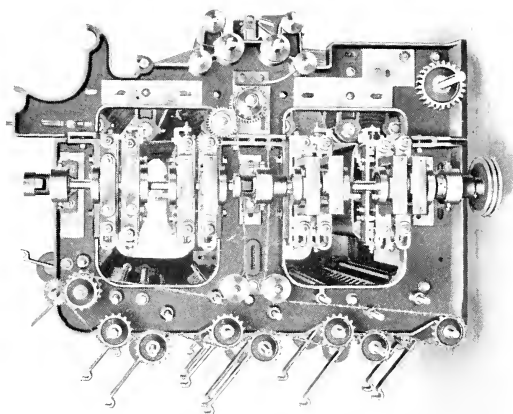
Carding of **Cotton Waste** by the condenser system is customarily done with **Two-Card Sets**, the cards being placed either tandem or side by side. In the set shown on the preceding page, the stock is fed to the breaker card by an automatic feeder which can be regulated to deliver the material evenly in any quantity desired. The breaker card is equipped with a metallic breast which helps break up any bunches and tends to save the card clothing. Also, it so opens up the stock that, instead of allowing it to be drawn in in bunches, it delivers the material in a fleecy, even web in which condition it is best prepared for the card proper to do its work, ensuring large productions and first quality of work. The web is taken from the doffer on a belt conveyer front, through side calender rolls and then by way of an overhead lattice apron to a cross-feed at the back of the finisher card. A diagonal feed may be had if preferred, but the lattice used with the cross-feed makes it feasible to use very short staple without the sliver breaking down. From the finisher card the web is carried to a four-bank **Tape Condenser** which separates and condenses it into from 80 to 96 good ends of roving, according to the class of work to be done. This type of condenser can make a much finer roving than the older types, with little variation in the size of the ends, and the spools of roving can be spun to comparatively fine numbers of waste yarn with very slight draft.

Both Breaker and Finisher Cards have a fancy roll, and all rolls have shell ends. The workers are chain-driven and the tops of the cards have substantial steel covers. The doffer comb motion which is run in oil, contained in an oil-tight comb box, can be driven at high speed without heat, noise or undue vibration.

The Production of this set is from 175 to 300 pounds per day of 10 hours. For detailed specifications, see descriptions of individual cards on pages 53 and 56.

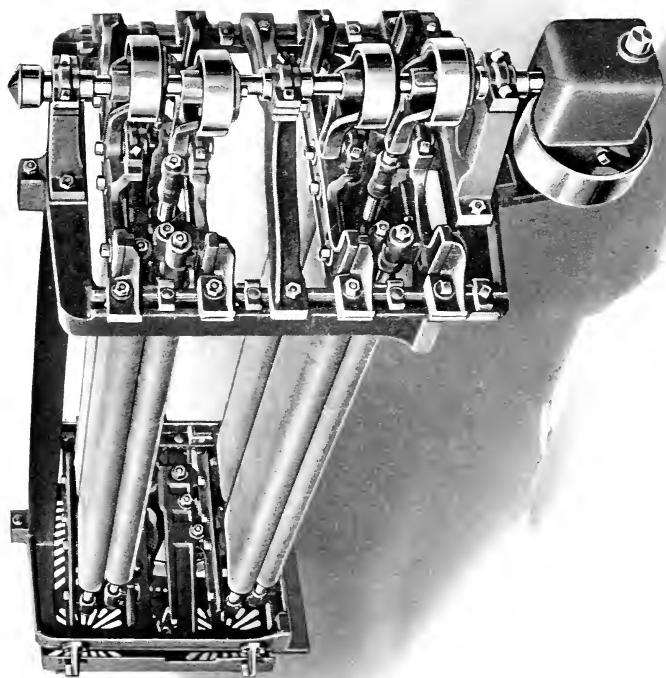


Front



End

Four-Bank Tape Condenser, arranged for Eight Spools



Two-Bank, Double Ring Doffer Condenser

FOUR-BANK TAPE CONDENSER

The **Four-Bank Tape Condenser** is a modern and most successful machine for condensing cotton waste roving, especially if the roving is to be spun into comparatively fine yarn. With this condenser the web from the card doffer passes between two grooved rolls, which separate the web into strips of exactly equal width, very much in the same manner that a piece of sheet steel is sheared by cutting rolls. The grip is not positive enough, however, to cut any individual fibres. Running in the grooves of both top and bottom dividing rolls are leather tapes to which the narrow strips of cotton web adhere as soon as they are separated. These tapes carry the web to the condenser rolls, which detach the web from the tape and rub it into roving, making from 80 to 96 good ends. The machine has been built to wind the roving on four, or eight spools, depending on the style of spinning frame following.

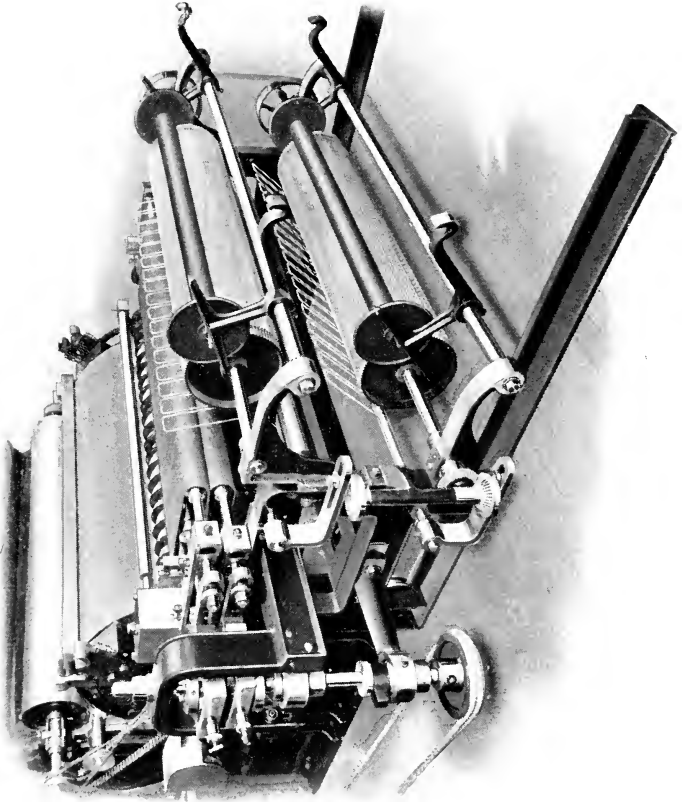
The method of separating the web on this condenser gives a very even roving, with little tendency to variation. It is also possible to make an unusually light roving, since other methods of condensing require that the strip of web from the doffer be strong enough to sustain its own weight. For the same reason it is possible to run very **Short Staple** because light roving can be spun with very little draft into fairly fine numbers of yarn. In quantity of **Production**, too, this type of condenser has the advantage over the old types, and marks a distinct advance in the methods of handling low grade cotton waste.

TWO-BANK DOUBLE-RING DOFFER CONDENSER

This type of condenser has been used in this country for many years in connection with the woolen system for low grade cotton. The cotton is taken from two doffers clothed with rings of card clothing separated from each other by narrow strips of leather. These leather rings serve to divide the web into strips of equal width, which are kept separate and carried forward by a large grooved roll to be rubbed into roving by the condenser. The number of ends to be taken off can be determined by the width of the clothing rings put on the doffers, 24 to 30 good ends from each doffer or 48 to 60 ends to a 48" card being a fair average. This is a standard type of machine and is preferred by many manufacturers for producing medium numbers.

One Bank, Single Ring Doffer Condenser
Driving (Side)

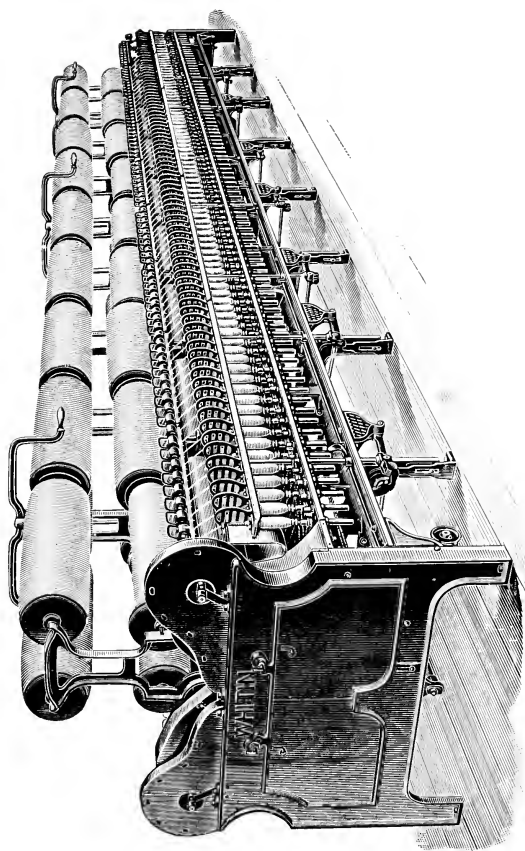




One Bank, Single Ring Doffer Condenser

SINGLE-BANK, SINGLE-RING DOFFER CONDENSER

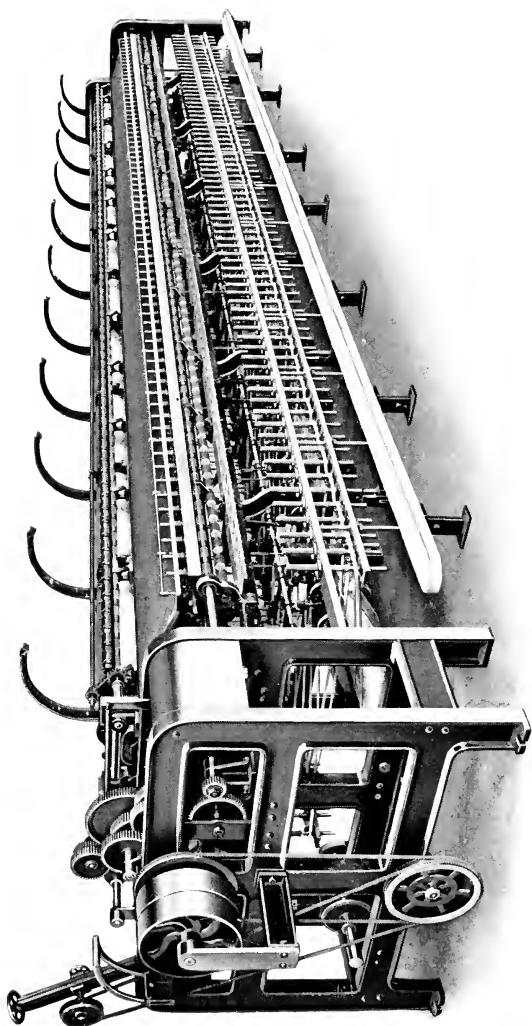
This Condenser is similar in operation to the double bank condenser, except that the regular 27" single doffer is used in place of two small doffers on the double bank condenser. Also, the stock is carried by grooved rollers from the doffer to the condenser aprons. This machine is used very widely, particularly for a production of medium count yarns, and not over 42 ends to the 48" width card is recommended. This machine particularly commends itself to coarse work, where the number of ends taken from the condenser are limited. It is a very popular arrangement, and in some cases the roving spool is taken directly from the condenser and placed in a special creel on a slubber, for the purpose of producing coarse yarns, either with or without draft.



Childs-Stewart Waste Spinning Frame

CHILDS-STEWART WASTE SPINNING FRAME

This Machine is designed particularly for the spinning of coarse yarns with no draft from oily cotton, card waste, comber noils, shoddies, sweepings, linters or other low grades of stock. It is particularly suitable for spinning such yarns as filling yarns for blankets and flannelettes, hosiery yarns, backing yarns for carpets, woolen goods and shoddies. As compared with Mule Spinning, these yarns can be spun on this frame with a considerable saving in labor, investment and horse power. The roving is delivered direct to this spinning frame from the jack spools made on the Card Condensers. The spools are placed in the creel of the frame and are supported by drums whose rotation carries the roving forward to the delivery rolls with little or no draft. The yarn is then spun by means of spinning rings and travelers in the same way as on an ordinary cotton ring spinning frame. **Practically No Draft** is imparted to the yarn in this process, and the result is a lofty and soft thread. The twist can, however, be increased when necessary for the making of backing or hard, strong yarns. Owing to the novel construction of the threadboard and adjacent parts, the snarling of ends is prevented when an end breaks after leaving the roll, as the broken end falls directly into a trough below, out of the way of contiguous ends. The accumulation of waste in the trough is readily removed by the operative, when desired, without having to stop the machine. The width of the machine is 48", and it is built in either 3", 3½" or 4" space with from 160 to 220 spindles. The framework is designed to embody strength and rigidity with neatness of detail and accuracy of workmanship.



The Whitin Wool Spinning Frame (Pease Patent)

WOOL SPINNING FRAME

(Pease Patent)

For many years it has been the aim of numerous inventors to devise a machine for the **Continuous Spinning of Wool**, with the object in view of overcoming the serious disadvantages of small production, excessive floor space, and large labor costs, existing at present in the spinning of wool on mules.

After several years of unremitting study and experiment, at great expense, the efforts in this direction have been crowned with success in the invention of a **Continuous Ring Spinning Frame for Wool**, under the patents of which we are now manufacturing our so-styled "**Wool Spinning Frame.**"

This frame has **Two Principal Features** of usefulness. While primarily it was designed for the spinning of woollen yarn, that is, rovings made on the woollen condenser card, it has been found to be equally applicable to rovings made on the same system from cotton or **Cotton Waste**, producing soft, full threads of low counts, with the least possible amount of twist, suitable for cotton blankets, robes, bedspreads, hosiery and knit goods, and, in fact, almost everything for which coarse counts of cotton yarn are used.

It is a well-established fact that the underlying principles of the mule are essential to give a sound thread from rovings made on a condenser card. All condenser roving is delivered to the spinning frame with a greater or less amount of uneven places in it. This consists of what is known as "twits" and bunches; and as the fibres from the condenser system are not laid parallel, the evening up of this unevenness can be more successfully accomplished by the introduction of twist during the drawing process. The effect of this is that the twist takes hold of the smaller places first at the expense of the thicker, so to speak, thereby holding these finer places, while the larger, softer parts of the roving are drawn down to a uniform size. This method of drawing is known as the mule system, or **Mule Method**, in contradistinction to that of the **Roll Method**, as described on page 75. In the latter method fine and large places are drawn uniformly, there being no equal-

izing of the varying sizes of the roving as delivered by the card. The principal feature of the Whitin Wool Spinning Frame is the adoption of the mule method in combination with the advantages of greatly increased production, less floor space and low labor costs of the ring system of spinning.

As will be seen by reference to the illustration of this frame, the roving spools from the condenser card are held between two parallel lines of drums, whose motion passes the roving to a pair of delivery rolls. It is then drawn over the deflector rod, through a twister tube, to the drawing rolls, and thence to the ring, and is wound on the bobbin in the usual way common to ring spinning.

In spinning yarns from **Cotton Waste** the draft between the delivery rolls and the drawing rolls is constant, and the process of drawing is materially aided by the twisting tube between the two sets of rolls, which imparts a false twist to the roving, and at the same time by means of two pegs on the top of the tube the roving is agitated during the drawing, which produces the same effect as is done by the slipping of the yarn off the spindle point in mule spinning.

Another Feature of this frame which enables yarns of soft twist to be spun is the traversing of the bolster rail, the ring rail being stationary, and consequently the traveler drag on the yarn is unvarying.

The Production depends upon the counts of yarn and class of material being spun. As compared with that of the mule it varies under different conditions from $1\frac{3}{4}$ to $3\frac{1}{2}$ times as much. The latter figure would apply to the spinning of fine warp yarns, and the former to the production of a very thick, soft twisted filling or knitting yarn.

The saving in **Floor Space**, as compared with the mule, is, of course, dependent upon the character of yarn spun. If it is a thick, soft yarn, the amount of space saved would not be more than 40%; but on fine counts, with a fair amount of twist (which all fine yarns necessarily have), the saving would reach as high as $\frac{2}{3}$ or $66\frac{2}{3}\%$. The actual over all dimensions of a 144-spindle frame, 4-inch gauge, would be 5 feet, 10 inches wide by 28 feet, 6 inches long. On a basis of two and one-half times greater spindle

capacity, there would be in this above-mentioned area an equal amount of 360 mule spindles.

Pulleys: 14-inch diameter by 3-inch face run 450 revolutions per minute.

Horse Power: About 30 spindles per horse power.

Weights:

Shipping weight 350 pounds per foot.

Net Weight 270 pounds per foot.



Waste Spinning Frame (Smith Patent)

WASTE SPINNING FRAME

(Smith Patent)

Since the adoption of the Mule for **Cotton Waste** spinning, it has been the hope of manufacturers making yarns by the condenser system that ring spinning be made adaptable for this class of work, so as to eliminate the use of the mule, which, at its best, is an expensive machine to operate, takes up a great amount of floor space, has a limited production, and requires considerable experience and skill in its operation. Wherever long and short fibre have appeared in the condenser roving, it has been impossible, heretofore, to obtain even results in drafting this roving under rolls, for the reason that where the rolls are set to the long staple, they consequently fail to grip the short staple contained in the roving, and drafting results in uneven yarn being obtained. On the other hand, if the rolls should be set to the short staple, the long staple is apt to be broken, resulting in cockled yarn. It is therefore obvious that any system of roll drafting that does not take into account the drafting of both long and short staple together is bound to be unsatisfactory as far as producing a nice, even yarn is concerned. Many unsuccessful attempts have been made by inventors to overcome this fault in roll drafting previous to the advent of the **Smith System** of rolls, which has finally succeeded in accomplishing very satisfactory results. In this system the object is attained by re-arranging the rolls and introducing therein additional ones of smaller diameter. This admits a closer setting for the short fibres, but does not break the longer ones.

This Arrangement, as applied to a ring spinning frame, consists of three bottom rolls and four top rolls. The front bottom roll carries two small top rolls, one of which is mounted slightly forward to present the proper angle for the delivery of the yarn to the yarn guides. The middle and back rolls, with their small top rolls, run at the same surface speed but slower than that of the front rolls; the difference in the speeds is the draft between the sets of rolls, which can be readily altered by change gears in the usual way.

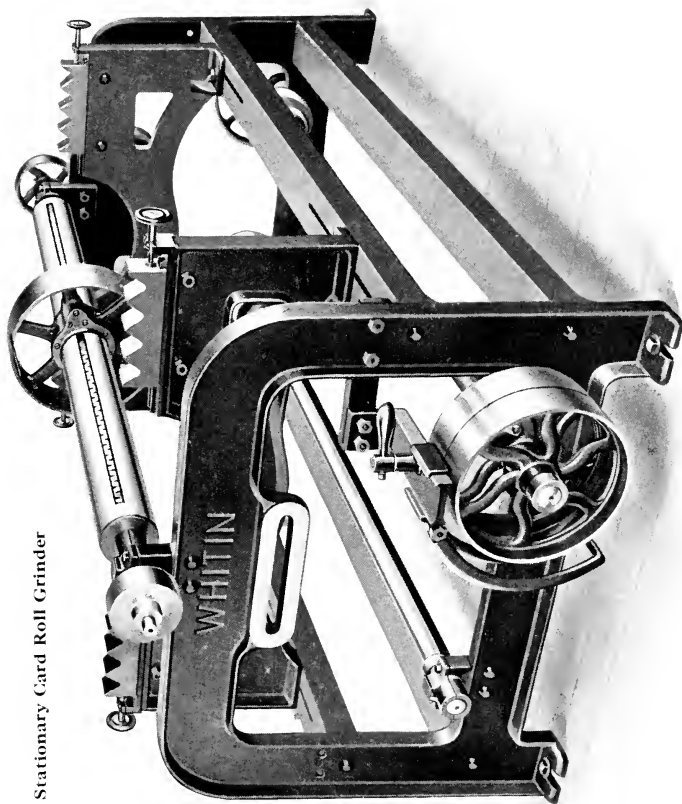
The drawing of the **Short Staple** is accomplished between the front and second rolls with their top rolls, which are set as close as $\frac{7}{16}$ " from nip to nip. For a long fibre the drawing takes place between the front and third bottom rolls, the small fluted top roll on the middle bottom roll being unweighted allows the long fibre to be drawn through without injury to the staple.

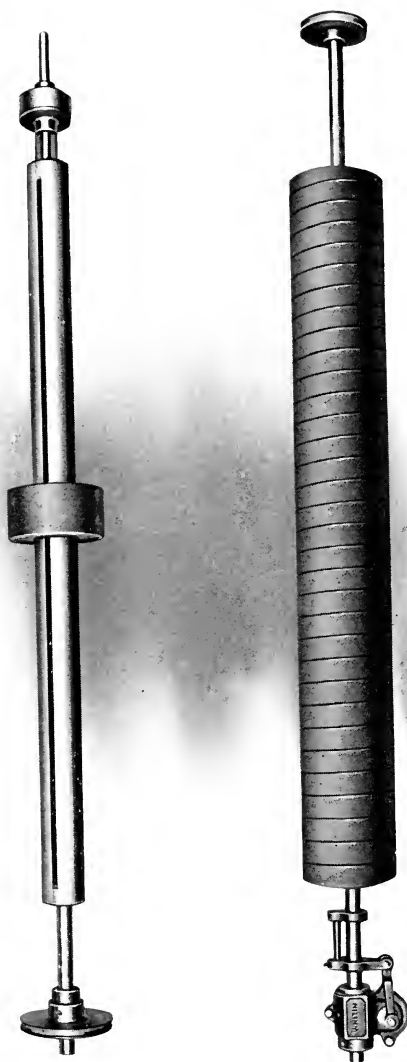
With the exception of this arrangement of the drawing rolls, the creel and a broken-end scavenger device, this frame is similar in appearance and construction to the ordinary ring frame for spinning cotton yarns. The creel consists of two parallel lines of drums holding the condenser spools, from which the roving passes to the drawing rolls. **The Broken-end Scavenger Device** (patent pending) consists of a leather belt slowly moving beneath the front roll, whereby waste due to broken ends is automatically collected and conveyed to the foot end of the frame, where it is easily removed.

The frames are built of such number of spindles and space to suit the requirements of manufacturers. The space should be such as to make unnecessary the use of separators, although they can be furnished if desired, but their use is not advisable, as it is not possible to obtain as soft and lofty a yarn with them as can be done without them on the wider space frame.

For further details, such as floor spaces, productions, gear changes, etc., see our 1911 catalog on "Cotton Yarn Machinery," pages 10 to 116.

Stationary Card Roll Grinder





Card Grinding Rolls

CARD GRINDERS

The most essential accessory in the Card Room is a reliable grinding apparatus. Without perfect grinding, the clothing for the Cards, although of the best quality and properly applied, will give unsatisfactory results.

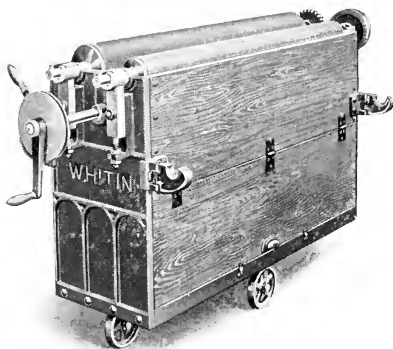
In order that manufacturers may be assured of obtaining the best results, we are prepared to supply grinding apparatus of superior quality for cards from 36" to 51" wide, as illustrated on preceding pages.

The stationary Card Roll Grinder, shown on page 77, combines all the essential features necessary in the make up of a perfect grinder. The frame is particularly well adapted to the work it has to do, viz., the grinding of the worker and stripper rolls, it being very heavy and strong and especially designed to resist vibration.

The Traverse Grinder and Long Grinder illustrated on page 78 are designed for both flats and rolls for all widths.

Our improved Stripping Truck (patent pending) is a useful adjunct to Full Roller Cards. By means of this machine the workers and strippers are conveniently cleaned.

The amount of grinding tackle necessary depends on the number of Cards in operation, but one Stationary Grinder, one or two Traverse Grinders, and one Stripper Roll are necessary where Full Roller Cards are put in for the first time.



Roll Stripping Truck

Repairs.

We have issued for the convenience of users of our machinery, **Illustrated Circulars of the Component Parts** of each machine which we build. The various pieces are illustrated in a clear manner, numbered and named, so that if the directions for ordering repairs, as stated in circulars, are followed there will be no doubt but what the orders will be correctly filled, with the least possible delay. Copies of these circulars have been sent to all our customers, and extra copies will be sent on application.

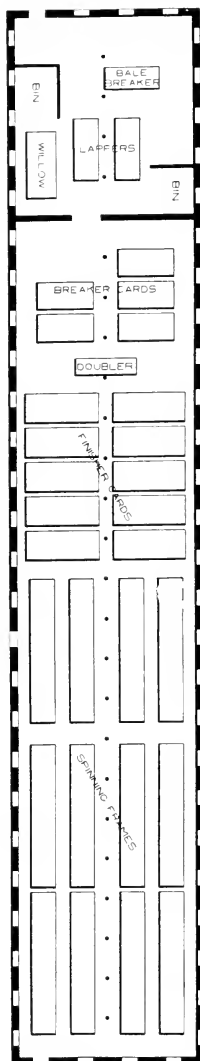
The Hands of Machines.

To determine the **Hands** of our **Machines**, face the delivery and note which hand side the driving pulleys are.

Shipping Directions.

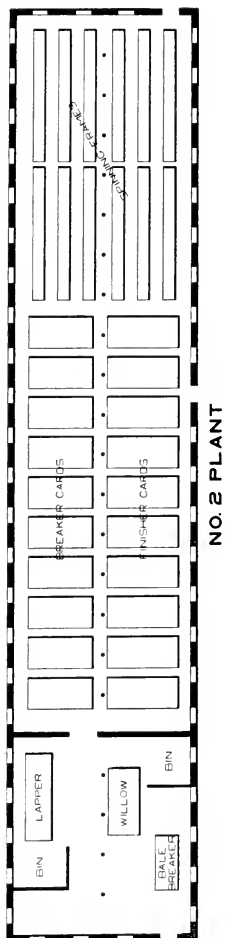
We prefer our customers to furnish directions for shipping their orders, but if not given and the package is small, we send by express, if large by freight, selecting the most reliable routes and the lowest freight rates that can be secured.

NO. 1 PLANT



No. 1 Plant for spinning counts 5's to 10's from broken up thread waste, etc., or comber waste, on the **Condenser System**, to give a soft, full, lofty yarn:—

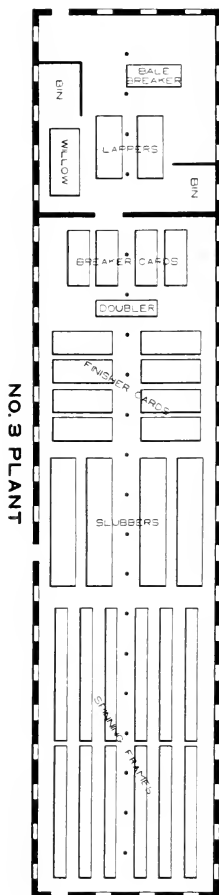
- | | | |
|----|--|------------------|
| 1 | Bale Breaker | See Page 14 |
| 1 | Willow | See Page 16 |
| 1 | 1-Beater Breaker Lapper, with Automatic Feed
and Evener and Adjustable Feed Regulator . . . | See Page 18 |
| 1 | 1-Beater Finisher Lapper | See Page 20 |
| 5 | Full Roller Breaker Cards, 48" wide, equipped
with Metallic Breasts and Double coiler Fronts . . | See Page 40 |
| 1 | Derby Doubler, doubling 40 ends | See Page 34 |
| 10 | Finisher Full Roller Cards, 48" wide, equipped
with Double Lap Backs and 4-Drum Tape
Condenser | See Pages 56, 61 |
| 12 | Wool Spinning Frames (Pease Patent) 3½" Gauge,
216 spindles each | See Page 70 |



NO. 2 PLANT

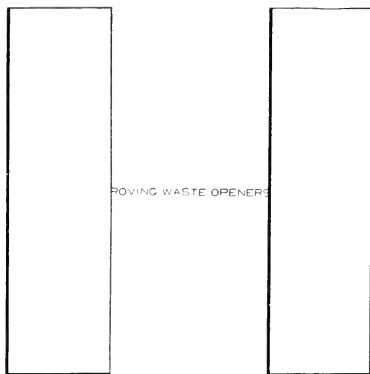
No. 2 Plant for spinning counts, say, 1's to 8's from soft waste, including picker droppings, card fly cylinder and top flat strips, clearer waste, sweepings, etc., on the **Condenser System**, to give an even, full and lofty yarn:—

- | | | |
|----|--|-------------|
| 1 | Bale Breaker | See Page 14 |
| 1 | Willow | See Page 16 |
| 1 | 2-Beater Breaker Lapper, with Automatic Feed,
delivering stock to bins through distributing
lattice, etc. | See Page 19 |
| 10 | Full Roller Breaker Cards, 48" wide, equipped
with Automatic Feeds, Metallic Breasts, Belt
Conveyer Fronts, feeding sliver across to
Finisher Cards | See Page 59 |
| 10 | Finisher Cards, equipped with Cross Feed, Double
Apron Condensers | See Page 63 |
| 12 | Waste Spinning Frames (Smith Patent), 3½"
Gauge, 216 Spindles each | See Page 74 |



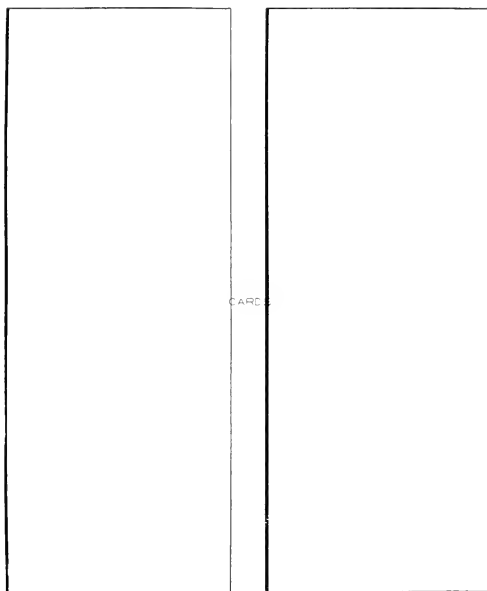
No. 3 Plant for spinning counts, say 3's to 12's, from low-grade cotton or waste, including strips, comber waste, etc., on the **Coiler System**, to give a good strong yarn:—

- | | | |
|----|---|-------------|
| 1 | Bale Breaker | See Page 14 |
| 1 | Willow | See Page 16 |
| 1 | 1-Beater Breaker Lapper, equipped with Automatic Feed | See Page 18 |
| 4 | Breaker Full Roller Cards, 45" wide, equipped with Double Lap Backs, Metallic Breasts and Double Coiler Fronts | See Page 40 |
| 1 | Derby Doubler, doubling 40 ends | See Page 34 |
| 8 | Finisher Cards (either Full Roller or Revolving Flat) equipped with Metallic Breasts and Double Lap Backs, 8-Coiler Fronts using cans 10, 11 or 12" in diameter by 36" high, making a sliver from 8 to 20 grains per yard | See Page 41 |
| 4 | Special Slubbers, 9" x 4½" x 7", 96 Spindles each | See Page 44 |
| 12 | Ring Spinning Frames, especially constructed to spin low-grade yarns, 4" Gauge, 216 Spindles each | See Page 47 |



MOVING WASTE OPENER

NO. 4 PLANT



CARD

No. 4 Plant for converting high-grade spinning waste and fine roving waste into slivers that can be put up back of the Drawing Frame, to go forward with the regular work:—

- 2 Roving Waste Openers See Page 26
- 2 Full Roller Cards, 45" wide, equipped with Automatic Feed or Hand Feed, with either one Coiler with Belt Conveyer Front or Double Coiler Front See Page 28

NO. 5 PLANT

ROVING WASTE OPENERS

CARDS

DOUBLER

COMBERS

No. 5 Plant for reclaiming high-grade strips, comber noils and in some cases spinning waste and roving waste mixed with it, that can be put up back of the Drawing Frame to go forward with regular work:—

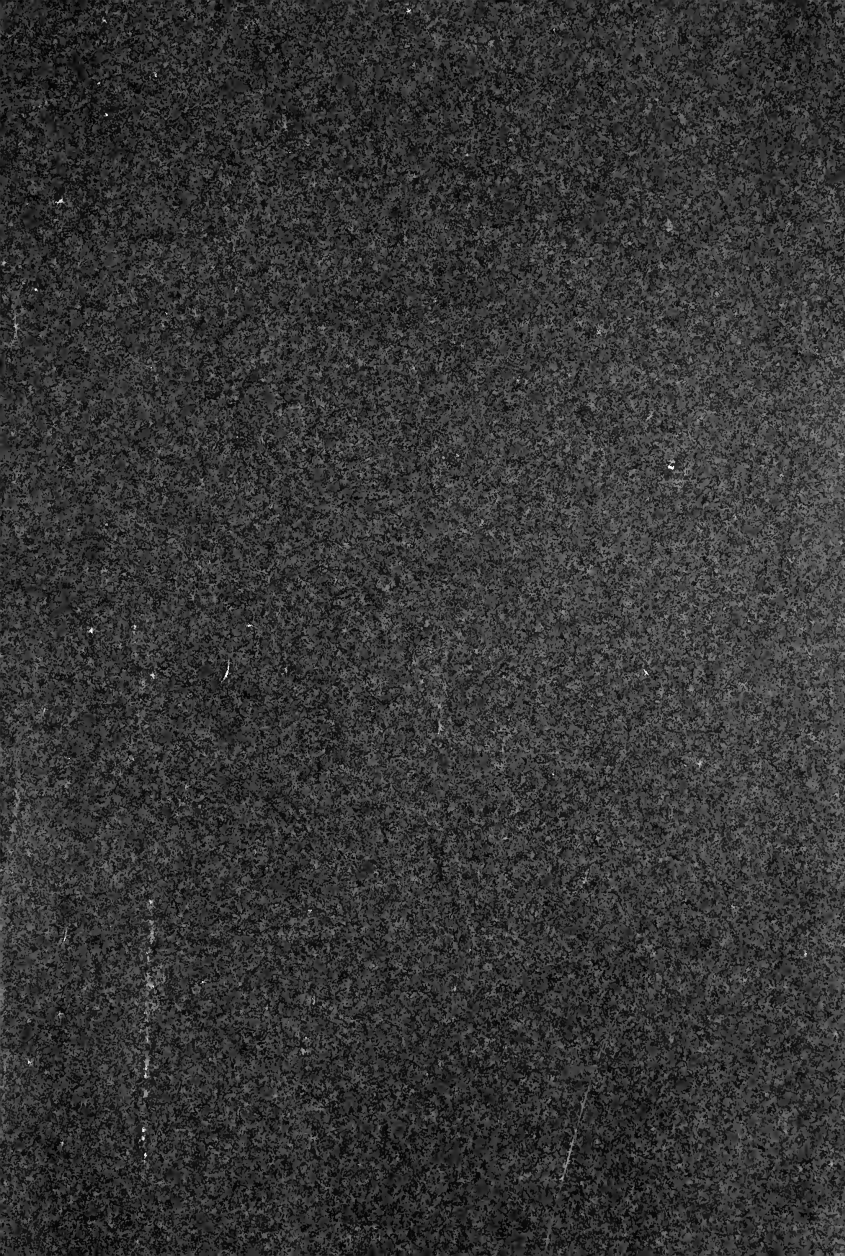
- | | | |
|---|---|-------------|
| 2 | Roving Waste Openers | See Page 26 |
| 4 | Revolving Flat Cards, 40" wide | See Page 32 |
| 1 | Derby Doubler, doubling 24 ends | See Page 34 |
| 4 | 8-Head Combers | See Page 36 |

Note. In connection with this plant the regular Picking System, which produces the laps for the regular work, is used. The mixture is made in the Picker Room by mixing the waste in proportion as it comes from the plant in the mill, and the laps are taken to the regular revolving flat cards mentioned in the above list.

STOCK TO BE USED

It is very important that the various kinds of stock mentioned in these plants for spinning certain classes of yarn should be used in such proportions as to give a mix that will spin well. This, of course, can be best determined in each case by the carder, but it should be borne in mind that it will not pay to cheapen the mix to a degree that will cause the work to run badly or necessitate too much extra twist. Poor running work and excessive twist mean a loss of production, which will more than counterbalance any saving in the cost of stock obtained by the use of too low a grade of waste. The successful waste plant must get the maximum production from its machinery, and this can be obtained only by using a grade of stock suitable for the yarn to be produced. On very low grades of waste a solution of oil and soap will sometimes help in getting the best results.





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